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Japanese (PDF)

File Wrapper Information

FULL CONTENTS CLAIM + DETAILED DESCRIPTION TECHNICAL  
 FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL  
 PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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**Notes:**

1. Untranslatable words are replaced with asterisks (\* \*\* \*).
2. Texts in the figures are not translated and shown as it is.

Translated: 03.23&gt;31 JST 03/17/2011

Dictionary: Last updated 04/3/2011 / Priority:

**FULL CONTENTS****[Claim(s)]**

[Claim 1] In an image output device which is provided with an ink discharge part which carries out discharge of the ink in a dot unit which constitutes a picture for every color of ink, and outputs a picture of at least 1 color on a recording medium by the discharge of the above-mentioned ink, An image output device having further a drying means which dries ink breathed out on the above-mentioned recording medium.

[Claim 2] The image output device according to claim 1, wherein the above-mentioned drying means is provided with a heating component generating heat and the heating component concerned is provided so that the above-mentioned recording medium and contact are possible.

[Claim 3] The image output device according to claim 2 characterized by a thing of the above-mentioned heating component for which the surface at least has water repellence.

[Claim 4] The image output device according to any one of claims 1 to 3, wherein the above-mentioned ink discharge part controls quantity of ink breathed out by recording medium for every dot.

**[Detailed Description of the Invention]**

[0001]

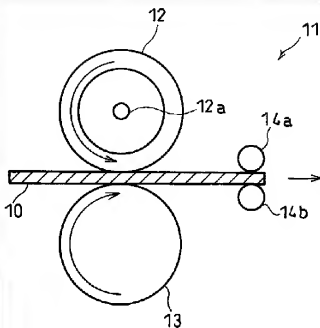
[Field of the Invention] This invention relates to the image output device which outputs a picture to a recording medium by carrying out discharge of the ink to a recording medium according to image data so that it may be represented by the ink-jet printer, for example.

It is related with the image output device provided with the drier style which dries the ink especially breathed out by the recording medium.

[0002]

Drawing selection

Representative draw



[Translation done.]

[Description of the Prior Art]The image output device which outputs the picture photoed, for example with the digital camera and the picture created and processed by the personal computer to the paper as a recording medium, and records it from the former is proposed variously. Although there are a thermal method, a heat transfer method, an inkjet method, a laser printing method, etc. in the recording method in an image output device, for example, There is an advantage of especially an inkjet method being a method which injects ink directly to a recording medium, and its running cost being cheap, and excelling also in the silence at the time of printing also in these. By progress of the art of these days, the grace of the picture formed by an inkjet method is also becoming high enough, and the use is spreading gradually. [0003]Here, the image output device (ink-jet printer) of the conventional inkjet method is explained below. Since the above-mentioned ink-jet printer is divided roughly into a method on demand and a continuous method, below, it explains these each.

[0004]As shown in [drawing 4](#), the ink-jet printer of the method on demand is provided with the ink discharge part 51 which carries out discharge of the ink per 1 dot of pictures. This ink discharge part 51 is provided with the pressurization chamber 52, the piezoelectric element (piezo-electric element) 53, and the oscillating partition 54.

[0005]In this composition, if the piezoelectric element 53 vibrates according to a picture signal, that vibration will get across to the oscillating partition 54, and the ink 55 with which vibration of this oscillating partition 54 was filled up in the pressurization chamber 52 will be pressurized. Thereby, the ink 55 is breathed out as the ink droplet 55a to a recording medium from the ink discharge mouth 52a provided in the pressurization chamber 52. That is, the ink-jet printer of a method on demand carries out discharge of the ink droplet 55a at the time of a signal input. The pressurization chamber 52 is open for free passage with the ink tank (not shown) which accommodated the ink 55 and was accumulated.

The ink 55 is supplied at any time from an ink tank.

[0006]Although the above-mentioned ink-jet printer is called what is called a PIEZO type that used the piezoelectric element 53, the method called a heat type (a bubble jet method, a thermal inkjet method) is also put in practical use. This heat type is a method which generates air bubbles and makes ink breathe out from a discharge mouth with the expansion pressure of air bubbles by arranging a heating plate and heating this heating plate in a pressurization chamber.

[0007]On the other hand, as shown in [drawing 5](#), the ink-jet printer of the continuous method is provided with the ink discharge part 61 which carries out discharge of the ink per 1 dot of pictures. The ink discharge part 61 is provided with PZT(piezo-electric element)62, the nozzle 63, the \*\*\*\* control electrode 64, the deflecting electrode 65, the ink catcher 66, the ink reservoir 67, and the pump 68.

[0008]In this composition, the ink currently stored in the ink reservoir 67 is pressurized by the ink pump 68, and reaches the nozzle 63. The ink which reached the nozzle 63 is continuously breathed out as the ink droplet 69a from the tip of the nozzle 63 according to the high frequency oscillation of PZT62, and passes the \*\*\*\* control electrode 64. According to a picture signal, an electric field is impressed to the \*\*\*\* control electrode 64, and an electric charge is suitably given to the ink droplet 69a which passes the \*\*\*\* control electrode 64 by this.

[0009]The ink droplet 69a which passed the \*\*\*\* control electrode 64 passes the deflecting electrode 65. Under the present circumstances, that by which electric charge grant was carried out among the ink droplets 69a can bend that direction of movement in response to the influence of the electric field

applied to the deflecting electrode 65, and reaches the paper 70. On the other hand, the ink droplet 69a by which electric charge addition is not carried out goes straight on as it is, and reaches the ink catcher 66. The ink in the ink catcher 66 is moved and accumulated [ accommodate and ] in the ink reservoir 67 through a piping course.

[0010]As mentioned above, the ink-jet printer of a continuous method circulates ink, breathing out the ink droplet 69a continuously from the nozzle 63, and forms a picture by controlling the flight direction of ink according to a picture signal.

[0011]

[Problem to be solved by the invention]By the way, in the conventional ink-jet printer, the ink breathed out by the paper is [ that natural seasoning is only carried out after that and ], and since it does not necessarily dry compulsorily, that ink is fixed to a paper takes time. As a result, in the composition of the conventional ink-jet printer, one paper [ finishing / ink discharge ] after another cannot be discharged in piles, but the problem that the processing speed of an ink-jet printer falls arises.

[0012]Since the ink breathed out by the paper is absorbed to some extent into a paper, natural seasoning may also fully be able to correspond, but. Depending on the paper which the degree of natural seasoning is influenced by the ink absorbency of a paper, and swelling nature, and is used, drying time for a long time \*\* This thing, \*\* When using an ink-jet printer for an industrial way and it takes that high-speed processing is required etc. into consideration, the present condition is fully being unable to respond in natural seasoning.

[0013]Made in order that this invention might solve the above-mentioned problem, the purpose is to provide the image output device which can dry promptly the ink breathed out by the paper regardless of the characteristic of ink and a paper, and can raise print processing capability.

[0014]

[Means for solving problem]In order that the image output device concerning the invention of Claim 1 may solve above-mentioned SUBJECT, In the image output device which is provided with the ink discharge part which carries out discharge of the ink in the dot unit which constitutes a picture for every color of ink, and outputs the picture of at least 1 color on a recording medium by the discharge of the above-mentioned ink, It is characterized by having further the drying means which dries the ink breathed out on the above-mentioned recording medium.

[0015]Since the ink breathed out on the recording medium is compulsorily dried by the drying means according to the above-mentioned composition, Ink can be early dried certainly rather than the case of natural seasoning, without drying time showing big variation like [ in the case of natural seasoning ] in the paper and ink to be used. It can become possible to discharge one paper after another in piles by this, and, as a result, the processing speed of an ink-jet printer can be raised conventionally. Therefore, the image output device of the above-mentioned composition becomes very suitable for the industrial way where the quickest possible processing speed is demanded.

[0016]As the above-mentioned drying means, it can constitute from a means (for example, the hot wind to a recording medium blowing a means, the irradiation means of far-infrared rays) dried, for example according to a recording medium and non-contact, a means dried by contacting exothermic material a recording medium and directly, etc.

[0017]In order that the image output device concerning the invention of Claim 2 may solve above-mentioned SUBJECT, in the composition of Claim 1, the above-mentioned drying means is provided with the heating component generating heat, and the heating component concerned is characterized by

being provided so that the above-mentioned recording medium and contact are possible.

[0018]since the heating component generating heat contacts a recording medium and directly according to the above-mentioned composition, compared with the case where a drying means is constituted from an above-mentioned means of a non-contact type, the transmission efficiency of the heat to the ink breathed out from a heating member to on a recording medium is markedly alike, and improves. Thereby, ink can be dried more quickly than a non-contact type.

[0019]When a heating component contacts a recording medium, the ink on a recording medium is pressed by the heating component, and climax of the ink on a recording medium is made flat. Thereby, since the diffused reflection in an ink surface can be reduced as much as possible, the further effect that glossiness can be given to ink can be acquired.

[0020]The image output device concerning the invention of Claim 3 is characterized by the thing of the above-mentioned heating component for which the surface at least has water repellence in the composition of Claim 2, in order to solve above-mentioned SUBJECT.

[0021]According to the above-mentioned composition, the thing of a heating component for which water repellence is given to the surface at least is possible with giving a water-repellent finish, for example on the surface of a heating component, or constituting the whole heating component from material which has water repellence. When the above-mentioned surface has water repellence, the ink breathed out on the recording medium is not conversely transferred by the heating component by contact with a heating component and the ink on a recording medium. Thereby, the image quality fall of a print picture is avoidable, and it is avoidable that the heating component surface is polluted with ink.

[0022]In order that the image output device concerning the invention of Claim 4 may solve above-mentioned SUBJECT, in one composition of the Claims 1-3, the above-mentioned ink discharge part is characterized by controlling the quantity of the ink breathed out by the recording medium for every dot.

[0023]According to the above-mentioned composition, gradation sequence expression becomes possible for every dot by discharge control for every dot of an ink discharge part. Since the unit of gradation sequence expression is smaller constituted compared with the former which does not change the amount of ink discharge to each dot, and expresses gradation sequence by this by making into a unit the field which consists of two or more dots by whether discharge of the ink is carried out to each dot, image quality can be raised conventionally.

[0024]When one image output system is constituted, for example for the image output device of this invention in combination with an image processing device etc., in order to aim at improvement in image quality, with the above-mentioned image processing device, error diffusion treatment is usually performed at least. Since this invention can aim at improvement in image quality by adopting the composition which controls the amount of ink discharge for every dot, it becomes unnecessary however, to already perform error diffusion treatment in an image processing device. Therefore, the Image Processing Division time in an image processing device can be shortened sharply, and the processing time as the whole system can be sharply shortened by this.

[0025]  
[Mode for carrying out the invention]It will be as follows if one form of operation of this invention is explained based on drawing 1 thru/or drawing 3.

[0026]Drawing 2 shows the composition of the outline of an image output system in which the ink-jet printer 1 as an image output device concerning

this invention is applied. This image output system comprises the image reader 2, the film scanner 3, the image processing device 4, and the monitor 5 other than the ink-jet printer 1.

[0027]The image reader 2 reads the image data recorded on the recording medium of the compact flash 6 which is a semiconductor memory card, or others. The above-mentioned image data is obtained by image pick-up with a digital camera, for example, or is obtained by picture creation with a personal computer etc. The image data read with the image reader 2 is supplied to the image processing device 4.

[0028]The film scanner 3 is a kind of image reader which reads the negative (positive) picture recorded on the film 7, and supplies the image data corresponding to the read original picture image to the image processing device 4.

[0029]The image processing device 4 performs various conversion processes (Image Processing Division) to the image data supplied from the image reader 2 or the film scanner 3 so that it may become image data suitable for supply to the ink-jet printer 1. There are edge emphasis processing, red amendment processing, etc. in which the outline of the picture which changes the image data of RGB (Red, Green, Blue) form into a YMC (Yellow, Magenta, Cyan) form suitable for an ink output as the above-mentioned conversion process, for example and which was processed and inputted is emphasized.

[0030]The monitor 5 displays the picture to which the conversion process was performed by the image processing device 4. The situation of a picture can be checked by this and it can be checked whether Image Processing Division, such as further color correction, is required.

[0031]With the image processing device 4, the ink-jet printer 1 breathes out ink based on the image data to which the conversion process was performed, forms a picture on recording media, such as paper, and comprises a recording head of the above-mentioned method on demand.

[0032]As shown in [drawing 3](#), specifically corresponding to each dot on a recording medium, two or more ink discharge mouth 8 -- is provided with the ink-jet printer 1 corresponding to the color of the ink which uses the ink discharge part 9 arranged in the shape of a line. Therefore, it is possible to output not only a monochrome picture but a color picture in the ink-jet printer 1.

[0033]This ink discharge part 9 has composition which can control the concentration of an output picture by changing the amount of discharge of ink for every dot. It is the composition of changing the quantity of the ink breathed out by the recording medium, by [ which are got blocked and carries out the overprint of the ink on a recording medium ] setting constant the quantity of the ink breathed out at once from each ink discharge mouth 8 in detail, and changing the number of times of ink discharge to each dot. By such composition, print dot size serves as a size according to the number of times of discharge of ink, as shown in the figure.

[0034]The ink discharge part 9 may be a thing of composition so that the amount of ink breathed out at once can be changed from each ink discharge mouth 8, of course.

[0035]Next, the drier style with which the ink-jet printer 1 concerning this invention is provided is explained.

[0036]The ink-jet printer 1 is provided with the dryer part 11 (drying means) which dries the ink breathed out on the paper 10 as a recording medium as shown in [drawing 1](#). The dryer part 11 is formed in the paper conveyance direction lower stream side to the ink discharge part 9 (refer to [drawing 3](#)), and comprises the heating roller 12 (heating component) which is a hollow roller, the support roller 13 by which opposite arrangement is carried out with the heating roller 12 concerned, and the conveyance rollers 14a and 14b by

which opposite arrangement is carried out mutually. The conveyance rollers 14a and 14b are further formed in the paper conveyance direction lower stream side rather than the heating roller 12 and the support roller 13, pinch the paper 10 by rotation of a mutual opposite direction, and convey it to the paper discharge side.

[0037]The heating roller 12 comprises silicon rubber whose measurement hardness by a rubber hardness meter defined, for example by a JIS standard is about 70, and 50 mm in diameter and the length of a shaft direction have become 6-15 inches. It counters with the support roller 13 and the heating roller 12 is arranged so that the paper 10 can be pressurized moderately.

[0038]The length of the quality of the material of the above-mentioned heating roller 12, hardness, a path, and the direction of an axis is not necessarily limited to these values. As the quality of the material of the heating roller 12, besides the above, for example, for example, NBR (acrylonitrile butadiene copolymerization rubber) system rubber, It is also possible to constitute from PTFE (polytetrafluoroethylene) system rubber, metal, etc., for example, what is necessary is to just be suitably set up on balance with the quality of the material of the support roller 13, a drying rate, etc. For example, since the surface of ink on the paper 10 can be made flat more compared with a case where it constitutes from resin if the heating roller 12 is constituted from a hard roller which consists of metal etc., it is surmised that it is possible to give gloss further to the surface of the paper 10. [0039]The heater 12a is formed in heating roller 12 inside, and the surface of the heating roller 12 is heated by energization heating to the heater 12a more than normal temperature. Therefore, it is possible by adjusting the amount of energization to the heater 12a to change skin temperature of the heating roller 12 to 80-150 \*\*. The above-mentioned skin temperature is not necessarily limited to this range.

[0040]Fluoride coating of the surface is carried out and the heating roller 12 has water repellence and water resistance. When the ink breathed out on the paper 10 contacts the heating roller 12 by this, it can avoid that what is called an offset phenomenon in which the above-mentioned ink is conversely transferred by the heating roller 12 arises. As a result, the image quality fall of a print picture is avoidable, and it is avoidable that the heating roller 12 surface is polluted with ink.

[0041]A water-repellent finish of the heating roller 12 surface may not be limited to the above-mentioned fluoride coating, for example, may be PTFE coating. Since heating roller 12 the very thing will have water repellence when the heating roller 12 is constituted from PTFE system rubber above-mentioned, for example, the above-mentioned water-repellent finish to the surface of the heating roller 12 can be made unnecessary in this case.

[0042]The support roller 13 consists of metal, such as aluminum, for example, and 30-50 mm in diameter and the length of the shaft direction have become 6-15 inches. The length of the quality of the material of the above-mentioned support roller 13, a path, and the direction of an axis is not necessarily limited to these values, and should just be suitably set up on balance with the material of the heating roller 12, etc.

[0043]It can be rotated to an opposite direction by the above-mentioned heating roller 12 and the support roller 13 of each other so that the paper [ finishing / ink discharge ] 10 may be pinched by the meantime and it can convey to the conveyance roller 14a and 14b side.

[0044]Next, operation of the ink-jet printer 1 and image output system concerning this invention is explained based on drawing 1 thru/or drawing 3.

[0045]In the above-mentioned composition, the image data recorded on the compact flash 6 by the image pick-up with a digital camera etc. is read with the image reader 2, and is transmitted to the image processing device 4. On the other hand, the original picture image recorded on the film 7 by

photography with an analog-type camera is scanned with the film scanner 3, and is changed into the image data corresponding to the above-mentioned original picture image, and the image data concerned is transmitted to the image processing device 4.

[0046]In the image processing device 4, various Image Processing Division is performed to the above-mentioned image data so that a proper picture may be outputted from the ink-jet printer 1. At this time, an operator checks the processing picture displayed on the monitor 5, and he does Image Processing Division to the image processing device 4 until a desired picture is obtained. Then, data transmission of the image data [ finishing / Image Processing Division ] is carried out to the ink-jet printer 1.

[0047]While the ink discharge part 9 controls the quantity of the ink which constitutes a picture and which is breathed out by the paper 10 for every dot by the ink-jet printer 1 according to the image data from the image processing device 4, discharge of the ink is carried out. Thereby, the dot of a size according to the amount of ink discharge is formed for every dot (refer to drawing 3). The paper 10 which the discharge of ink completed is conveyed by the latter dryer part 11.

[0048]In the dryer part 11, the heating roller 12 surface is beforehand heated by prescribed temperature with the heater 12a. The paper [ finishing / ink discharge ] 10 is conveyed between this heating roller 12 and support roller 13, and it is pinched, and the ink on the paper 10 is heated and stuck by pressure by this, and it is dried. Then, the paper [ finishing / a drying process ] 10 is discharged by rotation of a pair of conveyance rollers 14a and 14b at the paper discharge side.

[0049]As mentioned above, in this embodiment, it is the composition of forming the dryer part 11 in the latter part of the ink discharge part 9, and drying the paper [ finishing / ink discharge ] 10 compulsorily. Thereby, regardless of the ink absorbency and swelling nature of a paper, or the characteristic of ink itself, ink can be dried early and certainly. Therefore, even if it accumulates the paper [ finishing / ink discharge ] 10, ink cannot adhere to the back of the overlaid paper 10, so, the one paper [ finishing / ink discharge ] 10 after another can be discharged in piles, and the processing speed of the ink-jet printer 1 can be improved. As a result, it becomes possible to use the ink-jet printer 1 suitably for the industrial way where it is required of the quickest possible processing speed.

[0050]Although the dryer part 11 has the heating roller 12 and the case of the contact process which dries the ink on the paper 10 by contacting the paper 10 and directly was mentioned as the example in this embodiment, it is not necessarily limited to this. For example, the dryer part 11 may have the composition of drying the ink on the paper 10 by a non-contact type, such as spraying a hot wind on the paper 10, and irradiating with far-infrared rays.

[0051]However, according to a contact process like this embodiment, the following effects can be acquired. That is, in a contact process, since the heat from the heating roller 12 gets across to the paper 10 directly, thermal efficiency can be good and can dry ink earlier than a non-contact type. Since the ink on the paper 10 is stuck by press with the heating roller 12 by pressure in the case of a contact process, climax of ink is made flat. Thereby, the diffused reflection in an ink surface can be reduced as much as possible, and the further effect that glossiness can be given to ink can be acquired.

[0052]For example, in the field of a copying machine, after transferring to the paper of a toner image, the heating roller considered to be equivalent to this invention is used as a fixing means to fix the above-mentioned toner image to a paper. However, the heating roller 12 in the ink-jet printer 1 of this invention differs from the above-mentioned copying machine in that it has not only the dry function of ink but a gloss grant function to ink as described above.

[0053]Although the example which constituted the heating component from heating roller 12 simple substance was explained, an endless belt is not cared about with this embodiment as composition laid [ firmly ] with two or more rollers, for example. In this case, what is necessary is just to transpose at least one of the stretching rollers to the above-mentioned heating roller 12.

[0054]The composition of this invention which controls the quantity of the ink breathed out by the paper 10 for every dot is applicable also to a continuous method. However, in this case, since the member corresponding to each nozzle cannot be provided in common among two or more nozzles, there is a fault that the price of devices will become inevitable very expensive.

[0055]Next, since it has the ink discharge part 9 which controls the quantity of the ink breathed out by the recording medium for every dot according to the ink-jet printer 1 of this invention, the image quality of a print picture can be raised, and the processing speed in a system total can be gathered. Why such an effect is acquired is explained below.

[0056]In the former, the field which consists of a number dot of number dot of length x width was made into the unit field as a technique expressing the concentration of a print picture, the number of dots by which the ink in this unit field was breathed out determined the concentration (gradation sequence) of the unit field concerned, and the combination of these unit field was expressing the concentration of the whole picture. For example, when the above-mentioned unit field comprises a quadrangle field of a total of 16 dots which consists of 4 dots by 4 dots, the existence of the ink discharge to each dot can express one unit field by 16 gradation sequence.

[0057]On the other hand, in the composition of this invention, since the amount of ink discharge is controlled for every dot, for every dot, concentration is expressed, that is, the minimum unit of concentration expression can be made into 1 dot. Compared with the above-mentioned former which carries out concentration change by this for every unit field which consists of two or more pixels, concentration expression can be performed still more finely and, as a result, image quality can be raised extremely.

[0058]It is necessary to perform error diffusion treatment in the preceding paragraph (image processing device) of an ink-jet printer at the former which carries out concentration change for every above-mentioned unit field. In order to prevent the periodic striped pattern called moire, a texture, etc. to the whole picture from the boundary of an adjoining unit field being unnaturally expressed as this error diffusion treatment, or occurring, When expressing the gradation sequence of a predetermined unit field, it is the processing which uses as a continuation target the line drawing which makes reflect the gradation sequence information on the unit field which adjoins this (dot formation position information), and is formed ranging over between the concentration gradient between these contiguity unit fields, and a contiguity unit field. Therefore, in error diffusion treatment, complicated calculation processing follows for every unit field, and the operation of a total and huge quantity is usually performed to form one picture. Therefore, in the former, much time was spent on Image Processing Division in the ink-jet printer preceding paragraph, and this had also invited increase of the processing time as the whole system.

[0059]However, in the composition of this invention, since improvement in image quality can be aimed at as described above by controlling the amount of ink discharge for every dot, the necessity of aiming at improvement in the image quality by the error diffusion treatment in the above-mentioned image processing device is already lost. Therefore, according to the above-mentioned composition, error diffusion treatment in the ink-jet printer preceding paragraph can be made unnecessary, the Image Processing



Division time in an image processing device can be shortened sharply, and the processing time in a system total can be sharply shortened by this.

[0060] Since the Image Processing Division time per line generally increases the more the more it increases the number of the ink discharge parts of the ink-jet printer of a method on demand, when it thinks in picture total, the huge Image Processing Division time is needed. However, in this invention, since error diffusion treatment in the image processing device 4 can be made unnecessary and the Image Processing Division time can be shortened, as described above, although shortening falls victim for a while, it becomes possible to make the number of the ink discharge parts 9 increase conversely. In this case, improvement in the speed of the print processing by the ink-jet printer 1 can be attained further.

[0061] The performance of an image processing device is progressing every day, and the time which error diffusion treatment takes is being shortened sharply. That is, shortening of the Image Processing Division time in the ink-jet printer preceding paragraph has already progressed. Since this invention is composition which controls the amount of ink discharge for every dot, it takes picture output time somewhat for a long time compared with the former which outputs a picture by whether discharge of the ink is only carried out to each dot. However, even if it takes into consideration the length of the picture output time in the performance and this invention of an image processing device in this time, the experiment by a predetermined condition shows that the processing speed in a system total does not become slower than before at present.

[0062] [Effect of the Invention] The image output device concerning the invention of Claim 1 is composition further provided with the drying means which dries the ink breathed out on the recording medium as mentioned above.

[0063] So, since the ink breathed out on the recording medium is compulsorily dried by the drying means, regardless of the characteristic of the paper and ink to be used, ink can be dried early and certainly rather than the case of natural seasoning. This is enabled to discharge one paper [ finishing / ink discharge ] after another in piles, and the effect that the processing speed of an ink-jet printer can be raised conventionally is generated.

[0064] The image output device concerning the invention of Claim 2 is provided with the heating component in which the above-mentioned drying means generates heat in the composition of Claim 1 as mentioned above, and the heating component concerned is composition provided so that the above-mentioned recording medium and contact are possible.

[0065] So, since the heating component generating heat contacts a recording medium and directly, compared with the case where a drying means is constituted from a means of a non-contact type, the transmission efficiency of the heat to the ink breathed out from a heating member to on a recording medium is markedly alike, and improves. In addition to the effect by the composition of Claim 1, this generates the effect that ink can be dried more quickly than a non-contact type.

[0066] When a heating component contacts a recording medium, the ink on a recording medium is pressed by the heating component. Thereby, since climax of the ink on a recording medium is made flat, the effect that glossiness can be given to ink is generated collectively.

[0067] The image output device concerning the invention of Claim 3 is the composition of the above-mentioned heating component that the surface at least has water repellence, in the composition of Claim 2 as mentioned above.

[0068] So, the ink breathed out on the recording medium is not conversely transferred by the heating component by contact with a heating component and the ink on a recording medium. Thereby, in addition to the effect by the composition of Claim 2, the image quality fall of a print picture is avoidable,

and the effect that it is avoidable that the heating component surface is polluted with ink is generated.

[0069]The image output device concerning the invention of Claim 4 is composition which controls the quantity of the ink in which the above-mentioned ink discharge part is breathed out by the recording medium for every dot in one composition of the Claims 1-3 as mentioned above.

[0070]So, compared with the former which expresses gradation sequence by making into a unit the field which gradation sequence expression becomes possible for every dot, and consists of two or more dots, the unit of gradation sequence expression can be constituted smaller. As a result, in addition to the effect by one composition of the Claims 1-3, the effect that image quality can be raised conventionally is generated.

[0071]Since improvement in image quality can be aimed at, when an image output system is constituted, for example in combination with an image processing device, it can be managed even if an image processing device does not perform error diffusion treatment for raising image quality any longer. As a result, the Image Processing Division time in an image processing device can be shortened sharply, and the effect that the processing time as the whole system can be shortened sharply is collectively generated by this.

#### [Brief Description of the Drawings]

[Drawing 1] It is a sectional view showing the composition of the outline of the dryer part with which the ink-jet printer concerning this invention is provided.

[Drawing 2] It is a block diagram showing the composition of the outline of an image output system in which the above-mentioned ink-jet printer is applied.

[Drawing 3] It is an explanatory view showing the relation between the ink discharge part of the above-mentioned ink-jet printer and the ink droplet breathed out by the paper, and the dot size formed.

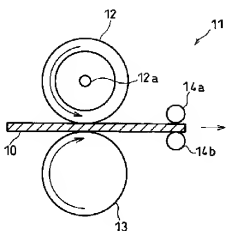
[Drawing 4] It is a sectional view showing the composition of the outline of the ink-jet printer of the conventional method on demand.

[Drawing 5] It is a sectional view showing the composition of the outline of the ink-jet printer of the conventional continuous method.

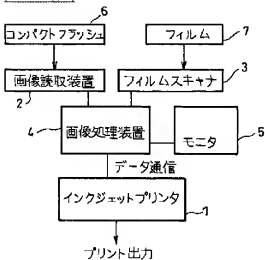
[Explanations of letters or numerals]

- 1 Ink-jet printer (image output device)
- 9 Ink discharge part
- 10 Paper (recording medium)
- 11 Dryer part (drying means)
- 12 Heating roller (heating component)

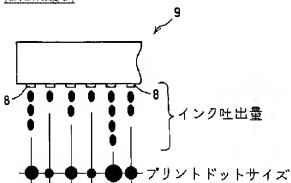
#### [Drawing 1]



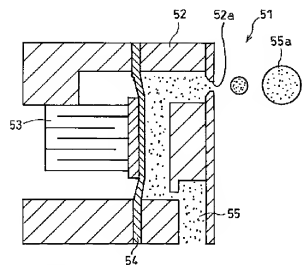
[Drawing 2]



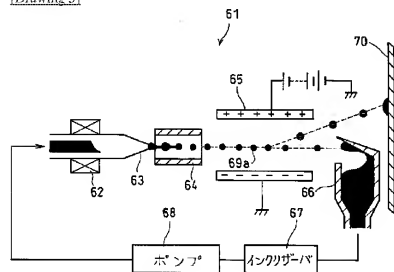
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]

Report Mistranslation

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